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Arthur A. Socolow, *State Geologist*

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G 71 **Glacial border deposits of late Wisconsinan age in northeastern Pennsylvania,** G. H. Crowl and W. D. Sevon. 1980. 68 p., 1 pl., surficial geol. map, scale 1:100,000. . . . . 9.20

MAPS

* 57 **Oil and gas well base map of the Renovo East, Waterville, Howard, and Lock Haven 15' quadrangles** (ozalid print, revised periodically). Scale 1:62,500. . . . . 0.50

* 58 **Oil and gas well base map of the Tioga, Troy, Blossburg, and Canton 15' quadrangles** (ozalid print, revised periodically). Scale 1:62,500. . . 0.50

MINERAL RESOURCE REPORT

M 78 **Mineralogy associated with burning anthracite deposits of eastern Pennsylvania,** D. M. Lapham and others. 1980. 82 p. 2.30

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1980

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Should you desire additional information, the Topographic and Geologic Survey will be glad to assist you in any manner.

Very truly yours,

Arthur A. Socolow
State Geologist

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Topographic maps of Pennsylvania are prepared by the United States Geological Survey in cooperation with the Bureau of Topographic and Geologic Survey. Persons wishing to know the names and scales of topographic maps that are available for Pennsylvania may obtain an **Index to Topographic Mapping** in Pennsylvania free on request from either:

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THE GEOLOGICAL SURVEYS OF PENNSYLVANIA

There have been four geological surveys of Pennsylvania and four resulting series of publications:

First Survey, 1836-1854: Publications—6 annual reports, 2 quarto-volumes, and a state geologic map.

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Third (Commission) Survey, 1899-1919: Publications—6 biennial reports and 12 economic reports listed in this pamphlet.

Fourth Survey, 1919- : Publications listed in this pamphlet (fourth series).

All reports of the first three geological surveys and some of the reports of the present (fourth) survey are out of print.

SOURCES OF OUT-OF-PRINT REPORTS

Many reports appearing in this list of publications are marked with an asterisk (*), indicating that they are out of print and no longer available for distribution. Out-of-print reports are available for study in many libraries throughout the state, particularly those in larger cities and at colleges.

The library of the Pennsylvania Geological Survey in Harrisburg is open for public use and contains all previous Pennsylvania Survey reports, as well as most of the U. S. Geological Survey, U. S. Bureau of Mines, and other governmental and institutional reports.

BIBLIOGRAPHIES OF PENNSYLVANIA GEOLOGY

For a complete annotated listing of all publications dealing with Pennsylvania geology, including journal articles and nongovernmental publications, please refer to the following General Geology Reports published by the Pennsylvania Survey:

G 34 **Annotated bibliography of Pennsylvania geology to 1949,** by H. R. Cramer

G 42 **Annotated bibliography of Pennsylvania geology—supplement to 1959,** by H. R. Cramer

G 61 **Annotated bibliography of Pennsylvania geology—supplement to 1969,** by H. R. Cramer

MAP SCALES

The list below shows map scales referred to on the following pages and indicates equivalent distances on the maps:

SCALE	EQUIVALENT DISTANCES ON MAPS
1:6,000	1 inch = 500 feet
1:12,000	1 inch = 1,000 feet
1:16,000	1 inch = 1,333 feet
1:24,000	1 inch = 2,000 feet
1:48,000	1 inch = 4,000 feet
1:50,000	1 inch = 4,167 feet
1:62,500	1 inch = approx. 1 mile
1:125,000	1 inch = approx. 2 miles
1:250,000	1 inch = approx. 4 miles
1:380,160	1 inch = approx. 6 miles
1:1,000,000	1 inch = approx. 16 miles
1:2,500,000	1 inch = approx. 39.5 miles

Other map scales cited in the List of Publications are followed by their equivalent distances.

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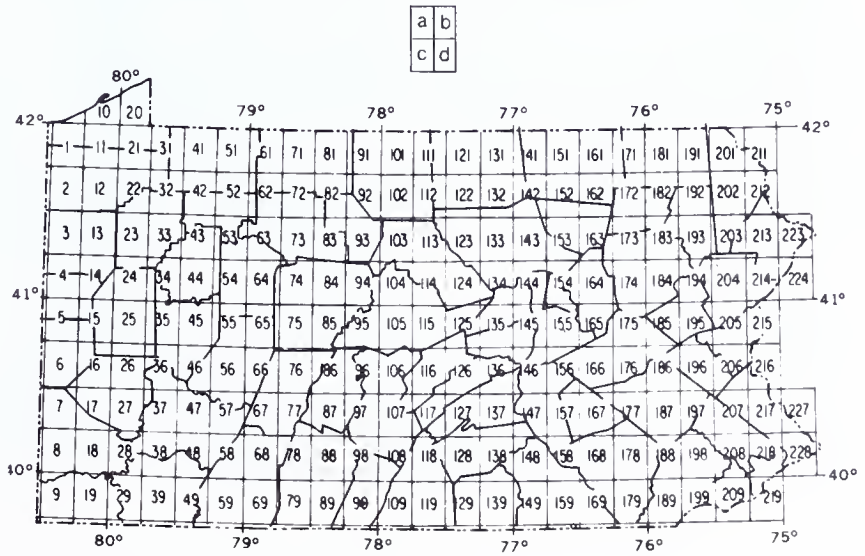
(Based on 15-minute quadrangles)



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ATLAS SERIES Map scale 1:24,000 unless otherwise indicated. Quadrangle names refer to 7½-minute series unless otherwise indicated.

A	5	**New Castle 15′ quadrangle** (Bessemer, New Castle South, New Galilee, and Beaver Falls 7½′ quadrangles), Lawrence and Beaver Counties, F. W. DeWolf. 1929. 238 p., 18 pls., bedrock geol. map, surficial geol. map, econ. geol. map, scale 1:62,500	$ 1.00
A	27	**Pittsburgh 15′ quadrangle** (Pittsburgh East, Braddock, Glassport, and McKeesport 7½′ quadrangles), Allegheny and Westmoreland Counties, M. E. Johnson. 1928; 3rd printing, 1974. 236 p., 33 pls., geol. map, min. resource map, scale 1:62,500	8.75
A	33a	**Oil City quadrangle**, Venango County, A. N. Ward, Jr., and others. 1979. Geol. map and text on 1 pl.	5.10
A	36	**Freeport 15′ quadrangle** (Freeport, Leechburg, New Kensington East, and Vandergrift 7½′ quadrangles), Armstrong, Westmoreland, Allegheny, and Butler Counties, H. H. Hughes. 1933. 272 p., 9 pls., geol. map, scale 1:62,500	1.75
A	37	**Greensburg 15′ quadrangle** (Murrysville, Slickville, Irwin, and Greensburg 7½′ quadrangles), Westmoreland and Allegheny Counties, M. E. Johnson. 1925; 3rd printing, 1974. 162 p., 13 pls., geol. map, econ. geol. map, scale 1:62,500	6.00
A	48	**Donegal 15′ quadrangle** (Mammoth, Stahlstown, Donegal, and Seven Springs 7½′ quadrangles), Westmoreland, Fayette, and Somerset Counties, M. N. Shaffner. 1963. 116 p., 4 pls., geol. map, coal reserve maps, scale 1:62,500	3.20
A	54	**Brookville 15′ quadrangle** (Corsica, Brookville, Summerville, and Coolspring 7½′ quadrangles), Jefferson and Clarion Counties, C. K. Graeber and R. M. Foose. 1942; 3rd printing, 1974. 136 p., 16 pls., geol. map, min. resource map, scale 1:62,500	7.00
A	55	**Smicksburg 15′ quadrangle** (Dayton, Valier, Plumville, and Marion Center 7½′ quadrangles), Jefferson, Indiana, and Armstrong Counties, M. N. Shaffner. 1946; 2nd printing, 1969. 252 p., 11 pls., geol. map, min. resource map, scale 1:62,500	8.75
A	57	**New Florence 15′ quadrangle** (Bolivar, New Florence, Wilpen, and Rachelwood 7½′ quadrangles), Indiana, Westmoreland, Cambria, and Somerset Counties, M. N. Shaffner. 1958. 165 p., 13 pls., geol. and min. resource map, scale 1:62,500; coal reserve maps, scale approx. 1:84,000 (¾ in.=approx. 1 mi)	4.80
A	64	**Hazen, Falls Creek, Reynoldsville, and DuBois quadrangles,** Jefferson and Clearfield Counties, A. D. Glover and W. A. Bragonier. 1978. 131 p., 16 pls., geol map, scale 1:24,000; coal resource maps, scale 1:48,000	21.55
A	65	**Punxsutawney 15′ quadrangle** (Punxsutawney, McGees Mills, Rochester Mills, and Burnside 7½′ quadrangles), Jefferson, Indiana, and Clearfield Counties, G. H. Ashley. 1926; 2nd printing, 1969. 145 p., 6 pls., geol. map, min. resource map, scale 1:62,500	7.00

A 74ab	**Sabula and Penfield quadrangles,** Clearfield, Elk, and Jefferson Counties, T. M. Berg and A. D. Glover. 1976. 98 p., 10 pls., geol. map, scale 1:24,000; coal reserve map, foundation and excavation map, scale 1:48,000	18.80
A 74cd	**Penfield 15' quadrangle** (southern half; Luthersburg and Elliott Park 7½' quadrangles), Clearfield County, W. E. Edmunds and T. M. Berg. 1971; 2nd printing, 1973. 184 p., 22 pls., geol. map, scale 1:24,000; coal reserve maps, foundation and excavation map, scale 1:48,000	8.60
A 75	**Curwensville 15' quadrangle** (Mahaffey, Curwensville, Westover, and Irvona 7½' quadrangles), Clearfield County, G. H. Ashley. 1940; 3rd printing, 1974. 140 p., 4 pls., geol. map, min. resource map, scale 1:62,500	6.00
A 84cd	**Clearfield 15' quadrangle** (southern half; Clearfield and Lecontes Mills 7½' quadrangles), Clearfield County, A. D. Glover. 1970; 2nd printing, 1973. 139 p., 15 pls., geol. map, scale 1:24,000; coal reserve maps, foundation and excavation map, scale 1:48,000	7.40
A 85ab	**Houtzdale 15' quadrangle** (northern half; Glen Richey and Wallaceton 7½' quadrangles), Clearfield County, W. E. Edmunds. 1968; 2nd printing, 1973. 150 p., 15 pls., geol. map, scale 1:24,000; coal reserve maps, scale 1:48,000	6.60
A 85cd	**Ramey and Houtzdale quadrangles,** Clearfield and Centre Counties, G. B. Glass and others. 1977. 94 p., 10 pls., geol. map, scale 1:24,000; coal resource maps, foundation and excavation map, scale 1:48,000	18.50
A 95a	**Philipsburg quadrangle,** Clearfield and Centre Counties, G. B. Glass. 1972. 241 p., 20 pls., geol. map, scale 1:24,000; coal reserve maps, foundation and excavation map, scale 1:48,000	10.10
A 96	**Tyrone 15' quadrangle** (Tyrone, Franklinville, Spruce Creek, and Alexandria 7½' quadrangles), Blair, Huntingdon, and Centre Counties, Charles Butts and others. 1939. 118 p., 14 pls., geol. map, scale 1:62,500	*
A 109a	**McConnellsburg quadrangle,** Fulton and Franklin Counties, K. L. Pierce. 1966; 2nd printing, 1974. 111 p., 3 pls., bedrock geol. map, surficial geol. map	4.15
A 119ab	**Northeastern Franklin County,** S. I. Root. 1971; 2nd printing, 1974. 104 p., 2 pls., geol. map	3.85
A 119cd	**Southeastern Franklin County,** S. I. Root. 1968. 118 p., 1 pl., geol. map	3.30
A 124a	**Lock Haven quadrangle,** Clinton and Lycoming Counties, A. R. Taylor. 1977. Geol. map and text on 1 pl.	5.55
A 126	**Mifflintown 15' quadrangle** (Alfarata, McClure, Mifflintown, and Mexico 7½' quadrangles), Juniata, Mifflin, and Snyder Counties, R. R. Conlin and D. M. Hoskins. 1962. 46 p., 2 pls., geol. map	4.75
A 127	**Loysville 15' quadrangle** (Spruce Hill, Ickesburg, Andersonburg, and Landisburg 7½' quadrangles), Perry, Juniata, and Cumberland Counties, J. T. Miller. 1961. 47 p., 2 pls., geol. map	8.85
A 129a	**Caledonia Park quadrangle and adjoining areas,** Adams, Cumberland, and Franklin Counties, J. L. Fauth. 1968. 133 p., 7 pls., geol. map.	2.85
A 129c	**Iron Springs quadrangle,** Adams and Franklin Counties, J. L. Fauth. 1978. 72 p., 1 pl., geol. map	7.00
A 133cd	**Salladasburg and Cogan Station quadrangles,** Lycoming County, R. T. Faill and others. 1977. 44 p., 2 pls., bedrock geol. map, surficial geol. map	11.25
A 134ab	**Linden and Williamsport quadrangles,** Lycoming County, R. T. Faill and others. 1977. 66 p., 2 pls., bedrock geol. map., surficial geol. map	13.20

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A 136 **Millerstown 15' quadrangle** (Beaver Springs, Richfield, Millerstown, and Reward 7½' quadrangles), Perry, Juniata, and Snyder Counties, R. T. Faill and R. B. Wells. 1974. 276 p., 6 pls., geol. map, scale 1:24,000; tectonic and environ. map, scale 1:48,000 ..... 23.00

A 137ab **New Bloomfield 15' quadrangle** (northern half; Newport and Duncannon 7½' quadrangles), Perry County, J. L. Dyson. 1963. 63 p., 1 pl., geol. map 2.55

A 137cd **New Bloomfield 15' quadrangle** (southern half; Shermans Dale and Wertzville 7½' quadrangles), Perry and Cumberland Counties, J. L. Dyson. 1967; 2nd printing, 1974. 86 p., 1 pl., geol. map 4.30

A 138ab **Carlisle and Mechanicsburg quadrangles,** Cumberland County, S. I. Root. 1978. Geol. map and text on 1 pl. 6.75

A 143cd **Montoursville North and Huntersville quadrangles,** Lycoming County, R. B. Wells and M. F. Bucek ..... (in press)

A 144ab **Montoursville South and Muncy quadrangles and part of the Hughesville quadrangle,** Lycoming, Northumberland, and Montour Counties, R. T. Faill. 1979. 114 p., 2 pls., bedrock geol. map, surficial geol. map 14.10

A 146 **Millersburg 15' quadrangle** (Dalmatia, Pillow, Millersburg, and Elizabethville 7½' quadrangles), Dauphin, Juniata, Northumberland, Perry, and Snyder Counties, D. M. Hoskins. 1976. 38 p., 2 pls., geol. map 12.80

A 148ab **Harrisburg West area,** Cumberland and York Counties, S. I. Root. 1977. 106 p., 1 pl., geol. map 9.65

A 157d **Palmyra quadrangle,** Lebanon and Dauphin Counties, A. R. Geyer. 1970. 46 p., 1 pl., geol. map 2.85

A 164cd **Bloomsburg and Mifflinville quadrangles and part of the Catawissa quadrangle,** Columbia County, J. D. Inners ..... (in press)

A 167c **Lebanon quadrangle,** Lebanon County, A. R. Geyer and others. 1958. Geol. map, text on reverse 1.90

A 167d **Richland quadrangle,** Lebanon and Lancaster Counties, Carlyle Gray and others. 1958. Geol. map, text on reverse 1.80

A 168 **Lancaster 15' quadrangle** (Manheim, Lititz, Columbia East, and Lancaster 7½' quadrangles), Lancaster and Lebanon Counties, A. I. Jonas and G. W. Stose. 1930. 106 p., 23 pls., geol. map, scale 1:62,500 1.00

A 174c **Berwick quadrangle,** Luzerne and Columbia Counties, J. D. Inners. 1978. 34 p., 2 pls., bedrock geol. map, surficial geol. map 12.00

A 177c **Womelsdorf quadrangle,** Lancaster, Lebanon, and Berks Counties, A. R. Geyer and others. 1963. 96 p., 1 pl., geol. map 2.85

A 177d **Sinking Spring quadrangle,** Berks and Lancaster Counties, D. B. MacLachlan and others. 1975. 228 p., 3 pls., geol. map, scale 1:24,000; tectonic map, scale 1:63,360 (1 in. = 1 mi) 17.50

A 178 **New Holland 15' quadrangle** (Ephrata, Terre Hill, Leola, and New Holland 7½' quadrangles), Lancaster County, A. I. Jonas and G. W. Stose. 1926; 2nd printing, 1969. 40 p., 7 pls., geol. map, scale 1:62,500 3.50

A 187ab **Temple and Fleetwood quadrangles,** Berks County, D. B. MacLachlan. 1979. 71 p., 2 pls., geol. map, scale 1:24,000; environmental geol. map and tectonic map, scale 1:48,000 ..... 12.25

A 194cd **Hickory Run and Blakeslee quadrangles,** Carbon and Monroe Counties, W. D. Sevon. 1975. Bedrock geol. map with text on reverse, surficial geol. map 9.10

A 195ab **Christmans and Pohopoco Mountain quadrangles,** Carbon and Monroe Counties, W. D. Sevon. 1975. Bedrock geol. map with text on reverse, surficial geol. map 11.20

A 195cd **Lehighton and Palmerton quadrangles,** Carbon, Northampton, and Lehigh Counties, J. B. Epstein and others. 1974. 460 p., 4 pls., bedrock geol. map, surficial geol. map 24.00

A 197 **Boyertown 15' quadrangle** (Manatawny, East Greenville, Boyertown, and Sassamansville 7½' quadrangles), Berks, Montgomery, and Lehigh Counties, T. V. Buckwalter. 1959. 15 p., 1 pl., geol. map 3.20

A 204ab **Tobyhanna and Buck Hill Falls quadrangles,** Monroe and Wayne Counties, W. D. Sevon. 1975. Bedrock geol. map with text on reverse, surficial geol. map 10.10

A 204cd **Pocono Pines and Mount Pocono quadrangles,** Monroe County, T. M. Berg and others. 1977. 66 p., 2 pls., bedrock geol. map, surficial geol. map 11.45

A 205a **Brodheadsville quadrangle,** Monroe County, T. M. Berg. 1975. 60 p., 3 pls., bedrock geol. map, surficial geol. map 9.50

A 206 **Allentown 15' quadrangle** (Catasauqua, Nazareth, Allentown East, and Hellertown 7½' quadrangles), Northampton, Lehigh, and Bucks Counties, B. L. Miller. 1925. 195 p., 15 pls., geol. and econ. geol. map, scale 1:62,500 ..... *

A 214a **Skytop quadrangle,** Monroe and Pike Counties, W. D. Sevon and T. M. Berg. 1978. 33 p., 1 pl., geol. map 6.50

A 214c **East Stroudsburg quadrangle,** Monroe County, M. F. Bucek. 1971; 2nd printing, 1974. 40 p., 1 pl., geol. map 2.65

A 223 **Milford and Port Jervis 15' quadrangles** (Pennsylvania portion; Shohola, Pond Eddy, Edgemere, Milford, Port Jervis North, and Port Jervis South 7½' quadrangles), Pike County, F. W. Fletcher and D. L. Woodrow. 1970. 64 p., 2 pls., geol. map, scale 1:62,500 ..... 2.10

COUNTY REPORTS Map scale 1:62,500 unless otherwise stated. County reports are numbered alphabetically within the Commonwealth.

C 1 **Geology and mineral resources of Adams County,** G. W. Stose. 1932. 153 p., 26 pls., topo. map, scale 1:62,500; geol. map, scale 1:125,000 *

C 1 **Part 2, Mineral resources of Adams County,** G. W. Stose. 1925. 61 p., 11 pls. ..... *

C 1 **Part 3, Soil survey of Adams County,** A. L. Patrick and H. H. Bennett. 1924. 43 p., soils map ..... *

C 9 **Geology and mineral resources of Bucks County,** Bradford Willard and others. 1959. 243 p., 24 pls., topo. map, geol. map 7.25

C 26 **Geology and mineral resources of Fayette County,** W. O. Hickok IV and F. T. Moyer. 1940; 2nd printing, 1973. 530 p., 3 pls., topo. map, geol. map, coal map 3.25

C 30 **Geology and mineral resources of Greene County,** R. W. Stone. 1932. 175 p., 3 pls., topo. map, geol. map, scale approx. 1:125,000 ... *

C 39 **Lehigh County,** B. L. Miller and others. 1941. 492 p., 39 pls., topo. and mine map, geol. map ..... *

C 48 **Northampton County,** B. L. Miller and others. 1939; 3rd printing, 1973. 496 p., 29 pls., geol. map 5.10

C 56A **Geology and mineral resources of southern Somerset County,** N. K. Flint. 1965; 2nd printing, 1973. 267 p., 13 pls., geol. map, coal reserve maps 6.75

C 67 **Geology and mineral resources of York County,** G. W. Stose and A. I. Jonas. 1939; 3rd printing, 1973. 199 p., 38 pls., geol. map ... 10.00

*Out-of-print

EDUCATIONAL SERIES

ES 1	**Common rocks and minerals of Pennsylvania,** D. M. Lapham and A. R. Geyer. 1962; 8th printing, 1979. 27 p.	free
ES 2	**Common fossils of Pennsylvania,** D. M. Hoskins. 1962; 8th printing, 1976. 18 p.	free
ES 3	**Ground water in Pennsylvania,** A. E. Becher. 1962; 6th printing, 1978. 42 p.	free
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# 50	**Oil and gas well base map of the Fairview, Erie, and North East 15′ quadrangles** (ozalid print, revised periodically). Scale 1:62,500	0.50
# 51	**Oil and gas well base map of the Girard, Linesville, and Pennsylvania portion of the Conneaut and Andover 15′ quadrangles** (ozalid print, revised periodically). Scale 1:62,500	0.50
# 52	**Oil and gas well base map of the Cambridge Springs, Union City, Meadville, and Townville 15′ quadrangles** (ozalid print, revised periodically). Scale 1:62,500	0.50
# 53	**Oil and gas well base map of the Ridgway, Benezette, Penfield, and Clearfield 15′ quadrangles** (ozalid print, revised periodically). Scale 1:62,500	0.50

# 54	**Oil and gas well base map of the Curwensville, Houtzdale, Patton, and Altoona 15' quadrangles** (ozalid print, revised periodically). Scale 1:62,500	0.50
# 55	**Oil and gas well base map of the Philipsburg, Bellefonte, Tyrone, and Allensville 15' quadrangles** (ozalid print, revised periodically). Scale 1:62,500	0.50
# 56	**Oil and gas well base map of the Driftwood, Renovo West, Karthaus, and Snow Shoe 15' quadrangles** (ozalid print, revised periodically). Scale 1:62,500	0.50

MINERAL RESOURCE REPORTS

M 1	**The oil and gas fields of Pennsylvania**, G. H. Ashley and J. F. Robinson. 1922. 79 p., 5 pls.	*
M 2	**Oil resources in coal and carbonaceous shales of Pennsylvania**, C. R. Fettke. 1923. 119 p., 6 pls.	*
M 3	**The silica refractories of Pennsylvania**, E. S. Moore and T. G. Taylor. 1924. 100 p., 16 pls.	*
M 4	**Bituminous coal losses and mining methods in Pennsylvania**, J. D. Sisler. 1924. 216 p., 1 pl.	*
M 5	**Lead and zinc ores of Pennsylvania**, B. L. Miller. 1924. 91 p., 5 pls.	*
M 6	**Bituminous coal fields of Pennsylvania.**	
	Part I. **General information on coal**, G. H. Ashley. 1928; 2nd printing, 1961. 241 p., 17 pls.	0.50
	Part II. **Detailed description of coal fields**, J. D. Sisler, 1926; 5th printing, 1978. 511 p., 14 pls.	2.25
	Part III. **Coal resources**, J. F. Reese and J. D. Sisler. 1928. 153 p., 4 pls.	0.25
	Part IV. **Coal analyses**, 2nd ed., prepared by U. S. Bur. Mines. 1928; 2nd printing, 1978. 168 p.	0.50
M 7	**Limestones of Pennsylvania**, B. L. Miller. 1925. 368 p., 15 pls. (replaced by M 20)	*
M 8	**Anthracite losses and reserves in Pennsylvania**, D. C. Ashmead. 1926. 71 p., 1 pl.	*
M 9	**Slate in Northampton County**, C. H. Behre, Jr. 1927. 308 p., 39 pls. (replaced by M 16)	*
M 10	**Fire clays of Pennsylvania**, J. B. Shaw. 1928. 69 p.	*
M 11	**Molding sands of Pennsylvania**, R. W. Stone and American Foundrymen's Assoc. 1928. 94 p., 21 pls.	*
M 12	**Anthracite culm and silt**, J. D. Sisler and others. 1928. 268 p., 34 pls.	0.50
M 13	**Feldspar in Pennsylvania**, R. W. Stone and H. H. Hughes. 1931. 63 p., 20 pls.	*
M 14	**Magnetite deposits of French Creek, Pennsylvania**, L. L. Smith. 1931. 52 p., 5 pls., geol. map, scale 1:62,500	*
M 15	**Building stones of Pennsylvania**, R. W. Stone. 1932. 316 p., 4 pls.	1.25
M 16	**Slate in Pennsylvania**, C. H. Behre, Jr. 1933. 400 p., 70 pls., geol. map of slate belt, Northampton Co., scale 1:62,500	3.50

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M 17	**Clay and shale resources in southwestern Pennsylvania,** Henry Leighton. 1932. 190 p., 1 pl., geol. map, scale 1:380,160	0.75
M 18	**The minerals of Pennsylvania.**	
	A. **Introduction,** G. H. Ashley. 1933. 16 p.	*
	B. **Iron ores of Pennsylvania,** W. O. Hickok IV. 1939; rev. reprinting, 1940. 21 p.	*
	C. **Non-metallic minerals,** R. W. Stone. 1939; reprinted 1940. 46 p.	*
M 19	**Contributions to oil and gas geology of western Pennsylvania,** J. D. Sisler and others. 1933. 96 p., 22 pls.	*
M 20	**Limestones of Pennsylvania,** B. L. Miller. 1934. 729 p., 41 pls.	2.00
M 21	**The Bradford oil field, Pennsylvania and New York,** C. R. Fettke. 1938; 2nd printing, 1973. 454 p., 26 pls.	3.00
M 22	**Oil geology of the Titusville quadrangle,** P. A. Dickey. 1941; 4th printing, 1974. 87 p., 6 pls.	1.00
M 23	**Clay and shale resources in Pennsylvania,** Henry Leighton. 1941; 2nd printing, 1959. 245 p., 1 pl.	1.25
M 24	**Oil and gas geology of the Franklin quadrangle,** R. E. Sherrill and L. S. Matteson. 1941; 2nd printing, 1963. 71 p., 4 pls.	0.80
M 25	**Oil and gas geology of the Oil City quadrangle,** P. A. Dickey and others. 1943; 2nd printing, 1963. 201 p., 8 pls.	1.70
M 26	**Iron-manganese ore deposits at White Rocks, Cumberland County,** R. M. Foose. 1945. 35 p., 14 pls., geol. map, scale 1:1,440 (1 in. = 120 ft)	*
M 27	**Manganese minerals of Pennsylvania,** R. M. Foose. 1945; 3rd printing, 1974. 130 p., 27 pls., geol. map of Sherman Creek area, scale 1:42,240 (1.5 in. = 1 mi)	2.25
M 28	**Oil and gas developments in the North Strabane area, Washington County,** C. R. Fettke and others. 1946. 62 p., 2 pls.	*
M 29	**McDonald and adjacent oil fields, Allegheny and Washington Counties,** A. I. Ingham and others. 1941; 2nd printing, 1949. 113 p., 10 pls.	2.00
M 30	**East Fork-Wharton gas field, Potter County,** J. R. Ebright and others. 1949. 43 p., 1 pl.	0.70
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M 32	**Crude oil reserves of Pennsylvania,** W. S. Lytle. 1950. 256 p., 1 pl. Extra map of oil fields, Pl. 1	1.25 0.10
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M 36	**Surface and subsurface structure of the Driftwood quadrangle,** R. C. Bolger and H. V. Gouse. 1953. 32 p., 3 pls.	0.55
M 37	**Oil and gas developments in the Appalachian Basin, past and present,** C. R. Fettke. 1953; 3rd printing, 1964. 15 p., 1 pl. (reprinted from The Mines Magazine, v. 42, no. 11)	*
M 38	**Oil and gas geology of the Sheffield quadrangle,** A. I. Ingham and others. 1956. 72 p., 9 pls.	1.00

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M 39 **Summarized record of deep wells in Pennsylvania, 1950 to 1954,** C. R. Fettke. 1956. 114 p., 5 pls. 1.00

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M 48 **Petrography of the Upper Freeport coal—Harmar and Springdale mines, Allegheny and Westmoreland Counties,** E. F. Koppe. 1963. 43 p. 0.50

M 49 **Mineral aspects of the Grace Mine magnetite deposit,** Akio Tsusue. 1964. 10 p. 0.15

M 50 **Atlas of Pennsylvania's mineral resources,** a 13½" x 18" looseleaf folio with cover.

Part 1. **Limestones and dolomites of Pennsylvania,** B. J. O'Neill, Jr. 1964; 2nd printing, 1973. 26 p., 6 fold-out maps plus text and tables, scale 1:250,000 . . . . . 2.75

Part 1S. **Supplement, Limestones and dolomites of Pennsylvania,** G. F. Deasy and others. 1967; 2nd printing, 1973. 83 p. 1.00

Part 2A. **Clays and shales of Pennsylvania,** B. J. O'Neill, Jr., and K. V. Hoover . . . . . (in preparation)

Part 2B. **Economics of Pennsylvania's clay and shale production,** G. F. Deasy and P. R. Griess. 1969. 25 p. 1.00

Part 3. **Metal mines and occurrences in Pennsylvania,** A. W. Rose. 1970; 2nd printing, 1973. 14 p., 1 pl. 1.60

Part 4. **The distribution of limestones containing at least 90 percent $CaCO_3$ in Pennsylvania,** B. J. O'Neill, Jr. 1976. 2 p., 1 pl., scale 1:500,000 (1 in. = approx. 8 mi) 1.15

M 51 **Properties and uses of Pennsylvania shales and clays,** B. J. O'Neill, Jr., and others. 1965; 2nd printing, 1973. 448 p. 4.15

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M 55 **Petrography of coal in the Houtzdale quadrangle,** Clearfield County, E. F. Koppe. 1967. 73 p. 1.05

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M 63	**Properties and uses of Pennsylvania shales and clays, southeastern Pennsylvania,** K. V. Hoover and others. 1971. 329 p.	4.95
M 64	**Proceedings: Fifth Forum on Geology of Industrial Minerals,** K. V. Hoover, ed. 1970; 2nd printing, 1974. 278 p.	2.35
M 65	**The petroleum industry and the future petroleum province in Pennsylvania, 1970,** D. R. Kelley and others. 1970; 2nd printing, 1974. 39 p.	0.60
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M 67	**Greater Pittsburgh Region construction aggregates,** B. J. O'Neill, Jr. 1974. 60 p., 3 pls., showing sand and gravel occurrences and sources of construction aggregate, scale 1:125,000	5.00
M 68	**Bituminous coal resources in western Pennsylvania,** compiled by M. A. Sholes and V. W. Skema. 1974; 2nd printing, 1975. 13 coal distribution maps, scale 1:250,000	5.30
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M 75	**The economic geology of the Upper Freeport coal in the New Stanton area of Westmoreland County, Pennsylvania: A model for coal exploration,** M. A. Sholes and others. 1979. 51 p.	2.80
M 76	**The economic geology of the Upper Freeport coal in northeastern Greene County,** V. W. Skema and others. 1980.	(in press)
M 77	**Properties and uses of shales and clays, southwestern Pennsylvania,** B. J. O'Neill, Jr., and J. H. Barnes. 1979. 689 p., 1 pl., geol. map, scale 1:250,000	11.00
M 78	**Mineralogy associated with burning anthracite deposits of eastern Pennsylvania,** D. M. Lapham and others. 1980.	(in press)

MISCELLANEOUS PAPERS

1	**The story of the Survey,** G. H. Ashley. 1920. 20 p.	*
2	**The work of the Survey, 1919-1922,** G. H. Ashley. 1923. 18 p. .	*
3	**The Pennsylvania Geological Survey, administrative report,** G. H. Ashley. 1931. 38 p.	*
4	**The resources of Pennsylvania in a nutshell,** G. H. Ashley. 1931. 15 p.	*
5	**Fifteen years, Sept. 1, 1919, to Sept. 1, 1934,** G. H. Ashley. 1934. 8 p.	*
6	**A quarter century of progress,** G. H. Ashley. 1944. 10 p.	*

OPEN-FILE REPORTS (Available for cost of copying; see p. 3 for ordering instructions)

A list of open-file reports of the Pennsylvania Geological Survey may be obtained by writing to the Survey.

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PG	2	**Hickory Run State Park: Hickory Run boulder field,** A. R. Geyer. 1969	free
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PG	11	**Ravensburg State Park,** A. R. Geyer and D. W. Royer. 1980. . . .	(in press)
PG	12	**Worlds End State Park,** D. W. Royer. 1980.	(in press)
PG	13	**Ricketts Glen State Park,** J. D. Inners. 1980.	(in press)
PG	14	**Nockamixon State Park,** J. D. Inners. 1980.	(in press)

PROGRESS REPORTS

PR 1-105	Mimeographed series of reports, all out of print, many superseded. See G 1 for partial list	*

*Out-of-print

PR 106 **Gas and oil in Potter Co.,** S. H. Cathcart. 1934. 31 p. ..... *

PR 107 **Gas in Tioga County,** S. H. Cathcart and T. H. Myers. 1934. 42 p. *

PR 108 **Geologic structure in the plateaus region of northern Pennsylvania and its relation to the occurrence of gas in the Oriskany sand,** S. H. Cathcart. 1934. 24 p. (replaced by PR 138) ..... *

PR 109 **The possibility of finding gas in Cameron County,** S. H. Cathcart. 1934. 16 p. ..... *

PR 110 **The possible occurrence of gas in the Oriskany sand of Elk County,** S. H. Cathcart. 1934. 21 p. ..... *

PR 111 **Possibility of finding gas in the Oriskany sand of McKean County,** S. H. Cathcart. 1934. 13 p. ..... *

PR 112 **The white clays of Pennsylvania,** Henry Leighton. 1934. 19 p. (see M 17 and M 23) ..... *

PR 113 **Pennsylvania geology summarized,** Bradford Willard. 1935. 4th ed., 1962, reprinted as ES 4 ..... *

PR 114 **Subsurface stratigraphy of northwestern Pennsylvania and a resume of gas and oil possibilities of deeper sands,** C. R. Fettke. 1935. 23 p. *

PR 115 **Structure and stratigraphy of Fayette County** (preliminary rept.), F. T. Moyer. 1937. 20 p., 1 map (see C 26) ..... *

PR 116 **Bradford oil field** (preliminary rept.), C. R. Fettke. 1937. 17 p. (see M 21) ..... *

PR 117 **Supplementary record of "deep sand" wells in Pennsylvania,** S. H. Cathcart. 1937. 27 p. ..... *

PR 118 **Geology of the oil and gas fields in the Tidioute quadrangle** (adv. rept.), S. H. Cathcart and others. 1938. 15 p., 6 maps, 181 well records *

PR 119 **The Canadian System,** G. H. Ashley. 1938. 7 p. ..... *

PR 120 **Structure and stratigraphy of the Brookville quadrangle** (preliminary rept.), C. K. Graeber. 1939. 9 p. (replaced by A 54) ..... *

PR 121 **Structure and stratigraphy of the Smicksburg quadrangle** (preliminary rept.), M. N. Shaffner. 1939. 12 p. (replaced by A 55) ..... *

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PR 123 **Oil mining possibilities in Pennsylvania,** P. A. Dickey. 1939. 31 p. *

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PR 127 **Subsurface sections across western Pennsylvania,** C. R. Fettke. 1941; 2nd printing, 1956. 51 p., 1 map 0.50

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PR 132 **Topographic maps,** R. C. Stephenson. 1949. 20 p. ..... *

PR 133 **Gas in Leidy Township, Clinton County,** S. H. Cathcart. 1950. 15 p. ..... *

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PR 134 **Preliminary report, Leidy gas field and adjacent areas, Clinton County,** J. R. Ebright and A. I. Ingham. 1951. 1 sheet (replaced by M 34) *

PR 135 **Oil and gas developments in Pennsylvania in 1950,** C. R. Fettke. 1951. 10 p., 1 pl. *

PR 136 **Preliminary report on certain limestones and dolomites of Berks County,** Carlyle Gray. 1951. 85 p., 1 pl., map of principal limestone areas, scale 1:125,000 0.50

PR 137 **Preliminary report, geology and mineral resources of the New Florence quadrangle,** M. N. Shaffner. 1951. (replaced by A 57) *

PR 138 **Geologic structures of the northern plateaus region of Pennsylvania,** A. I. Ingham. 1951. 1 sheet (revision of PR 108, pl. 2) *

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PR 141 **Preliminary report, geology and mineral resources of the Donegal quadrangle,** M. N. Shaffner. 1952. (replaced by A 48) *

PR 142 **Preliminary report, geologic structure of parts of the Chestnut Ridge and Driftwood anticlines in Clearfield and Elk Counties,** R. C. Bolger. 1953. Map with text on back, scale 1:62,500 0.30

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PR 144 **Oil and gas developments in Pennsylvania in 1953,** C. R. Fettke. 1954. 15 p., 2 pls. 0.20

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PR 147 **Developments in Pennsylvania in 1954** (reprinted from Am. Assoc. Petroleum Geologists Bull., v. 39, no. 6), C. R. Fettke and W. S. Lytle. 1955. 11 p. *

PR 148 **Summary secondary recovery operations in Pennsylvania to January 1, 1954 including petroleum reserves and production by counties,** W. S. Lytle. 1955. 23 p. 0.15

PR 149 **Preliminary report, geology and mineral resources of southern Somerset County,** N. K. Flint. 1956. Map with text on back (replaced by C 56A) *

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PR 153 **Preliminary report on the chromite occurrence at the Wood Mine,** D. M. Lapham. 1958; 2nd printing, 1974. 11 p., 2 pls. free

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PR 163 **Preliminary report of the oil and gas resources of the Warren 7½' quadrangle,** W. S. Lytle and L. A. Heeren. 1963. One sheet containing map and text (replaced by M 52) ..... *

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PR 167 **Bedrock geology of the Slate Run quadrangle, Clinton, Lycoming, and Potter Counties,** G. W. Colton and S. J. Luft. 1965. One sheet containing text and geologic map, scale 1:24,000 ..... 1.10

PR 168 **Oil and gas developments in Pennsylvania in 1964,** W. S. Lytle and others. 1965. 55 p. 0.50

PR 169 **Geology of a portion of the Mount Holly Springs quadrangle, Adams and Cumberland Counties,** Jacob Freedman. 1967; 2nd printing, 1974. 66 p., 3 pls., geol. map, scale 1:24,000 ..... 2.50

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W 49 **Groundwater resources of the Gettysburg and Hammer Creek Formations, southeastern Pennsylvania,** C. R. Wood. 1980 ..... (in press)

WELL SAMPLE RECORDS

#1-38, 42-55 Superseded by M 40

#56 **Jesse B. Miller No. 1 well, Napier Township, Bedford County,** C. R. Fettke. 1960. 43 p. 0.15

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Pennsylvania's mineral heritage. Bureau of Statistics, Bureau of Topographic and Geologic Survey, and The Pennsylvania State University, School of Mineral Industries. 1944. 248 p. ..... free

Historical statistics of Pennsylvania's mineral industries, 1759-1955. Bulletin of the Mineral Industries Experiment Station, no. 69. 1957. 94 p. ..... free

Pennsylvania geology. A bimonthly publication issued by the Bureau of Topographic and Geologic Survey. Generally 16 p., illustrated in two colors. Series begins with v. 1, no. 1, August 1969 ..... free

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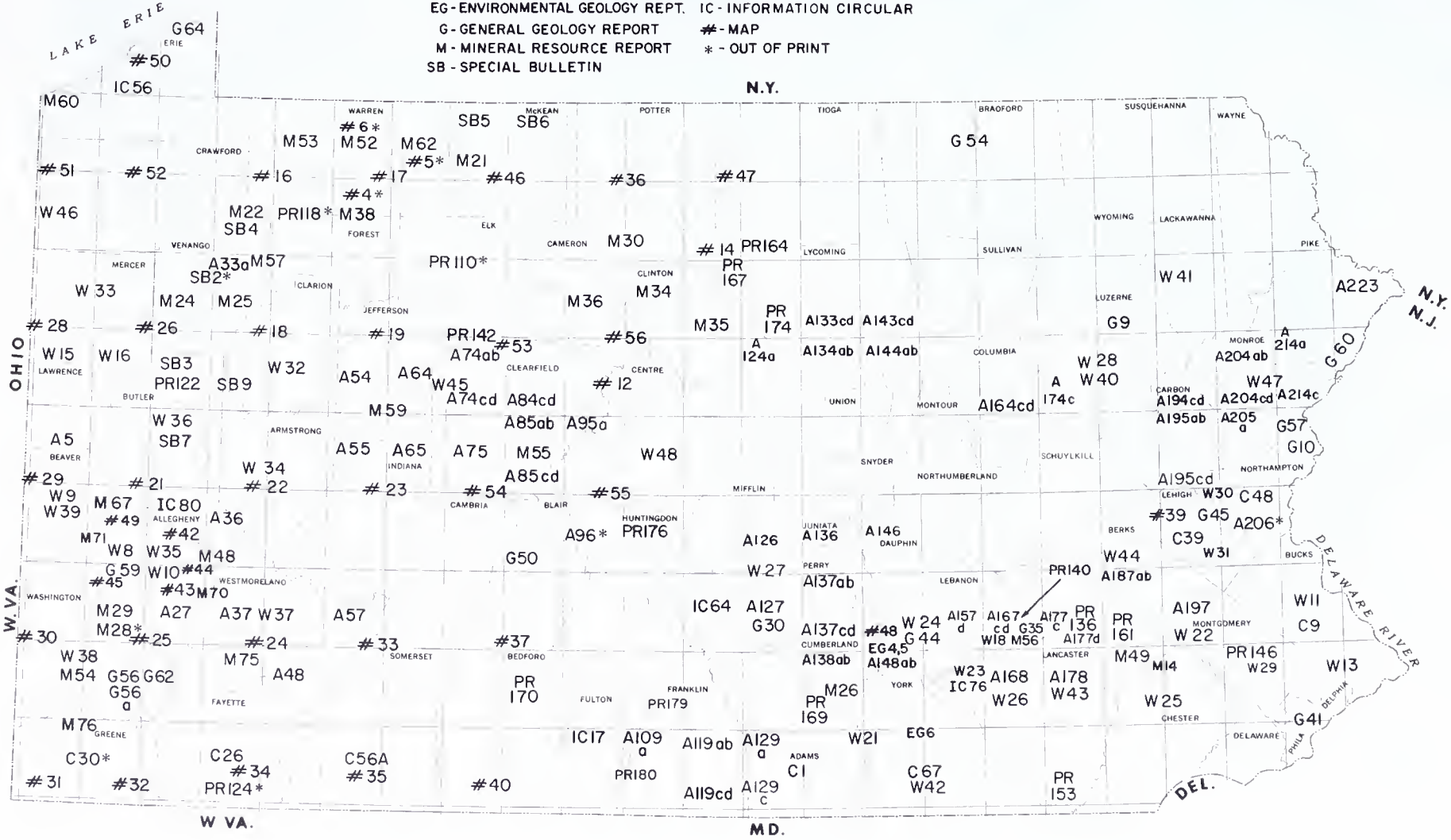

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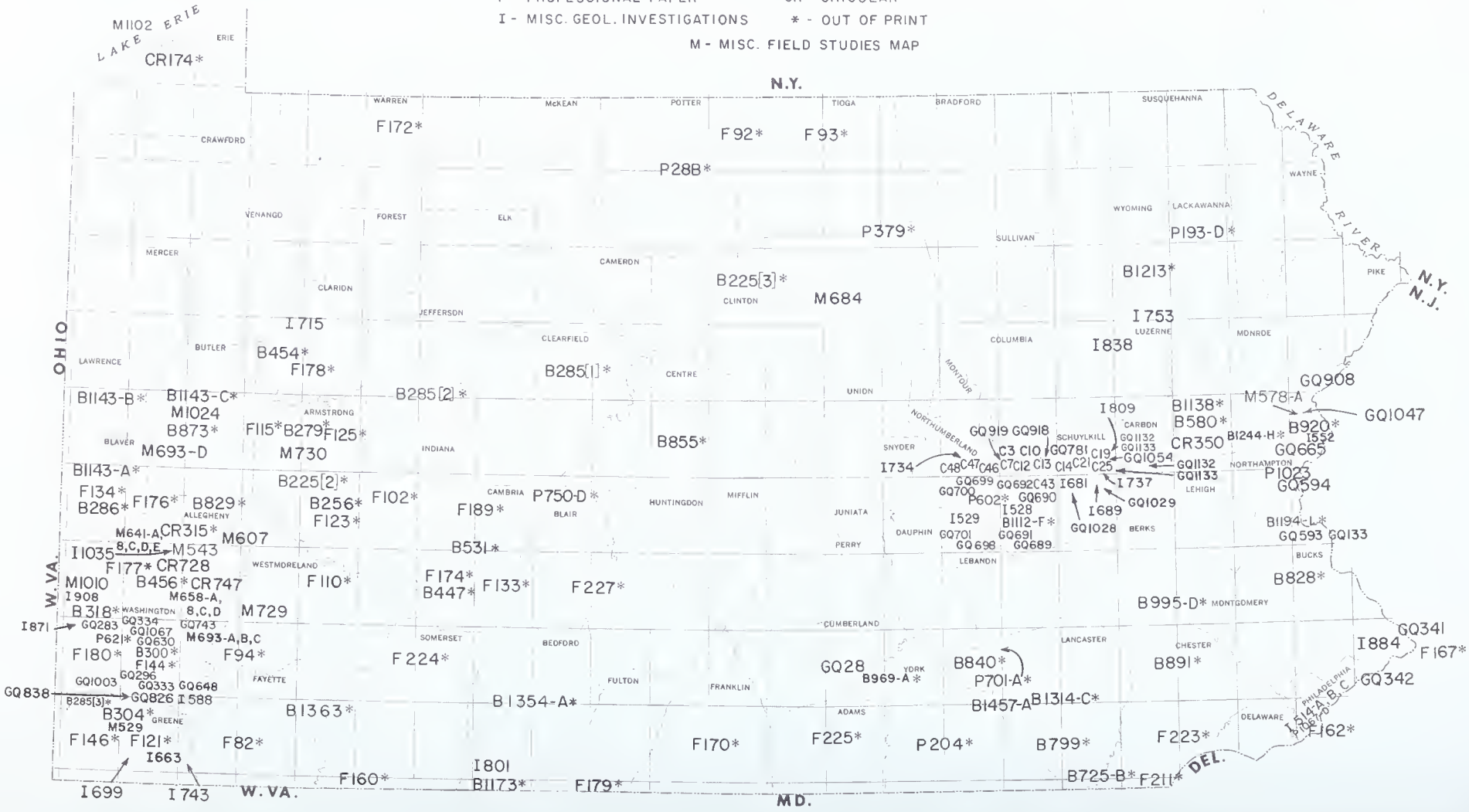

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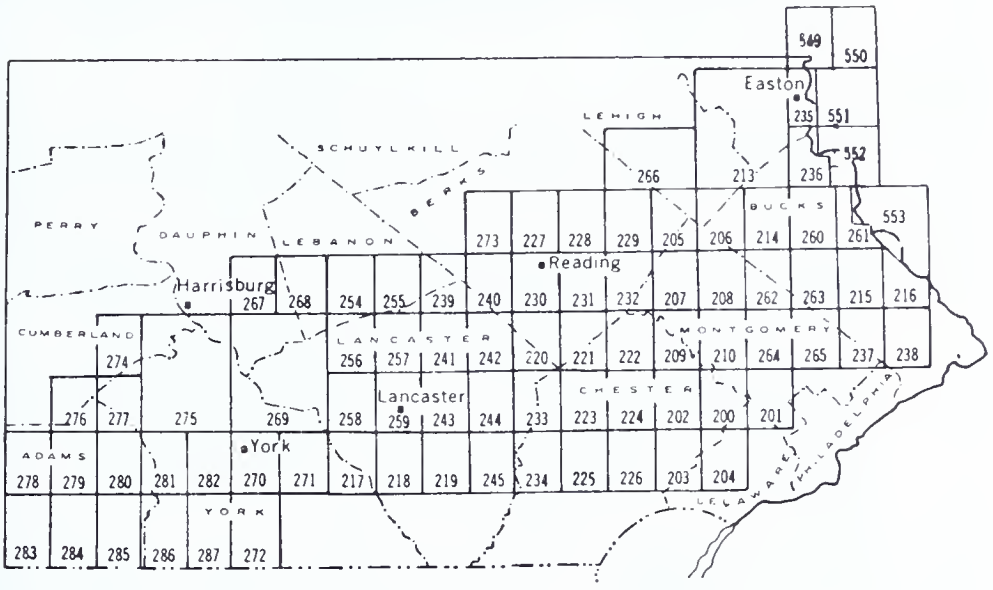

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Much additional information on Pennsylvania geology is available in publications not covered by this list. The reader is referred to Pennsylvania Geological Survey General Geology Reports 34, 42, and 61 for a complete list of all articles on Pennsylvania geology written before 1969.

Abbreviations used in this key are as follows:

Pennsylvania 3rd (Commission) Survey—Pa. Geol. Survey (3rd)

Pennsylvania Geological Survey, 4th series—Pa. Geol. Survey (4th)

- A ——— Atlas Series
- C ——— County Reports
- EG ——— Environmental Geology Reports
- ES ——— Educational Series
- G ——— General Geology Reports
- IC ——— Information Circulars
- M ——— Mineral Resource Reports
- Map ——— Map Series
- PG ——— Park Guides
- PR ——— Progress Reports
- SB ——— Special Bulletins
- W ——— Water Resource Reports
- WSR ——— Well-Sample Records

United States Geological Survey—U. S. Geol. Survey

- B ——— Bulletins
- Cir ——— Circulars
- CI ——— Coal Investigations Maps
- F ——— Folios
- GP ——— Geophysical Investigations Maps
- GQ ——— Geologic Quadrangle Maps
- HA ——— Hydrologic Investigations Atlases
- I ——— Miscellaneous Investigations Series
- MF ——— Miscellaneous Field Studies Maps
- OC ——— Oil and Gas Investigations Charts
- PP ——— Professional Papers
- WS ——— Water-Supply Papers

United States Bureau of Mines—U. S. Bur. Mines

- B ——— Bulletins
- I ——— Information Circulars
- R ——— Reports of Investigations
- TP ——— Technical Papers

Miscellaneous Publications—Misc.

Pennsylvania Office of Environmental Protection—Pa. Off. Environ. Protection

- A ——— Annual Report on Mining, Oil and Gas, and Land Reclamation and Conservation

Miscellaneous Publications — *(continued)*

Pennsylvania Office of Resources Management—Pa. Off. Resources Mgt.
B ——— Water Resources Bulletins
R ——— Report
SWP —— State Water Plan Bulletins

The Mineralogies of Pennsylvania—Min. Pa.
AM —— A. Montgomery (1969)
RS —— R. C. Smith, II (1978)
SG —— S. G. Gordon (1922; reprinted 1973)
WJ —— W. W. Jefferis (1854)

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Pa. Geol. Survey (4th): A 74ab; G 40; IC 16, 72; Map 17, 19, 46, 53; M 1, 4, 6, 10, 11, 18(C), 19, 23, 31, 32, 36, 39, 40, 50(1, 4), 66, 69, 74; PR 110, 138, 142, 148; W 6, 45
U. S. Geol. Survey: HA 295; I 936; PP 193-C, 263, 580; WS 109, 1835
U. S. Bur. Mines: R 6261, 6917, 7281
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 9

ERIE

Pa. Geol. Survey (4th): G 19, 32, 40, 49, 55, 64; IC 16, 56, 62, 79; Map 16, 50, 51, 52; M 1, 11, 18(C), 23, 31, 39, 40, 51, 60; PR 127; W 3
U. S. Geol. Survey: Cir 174; HA 295; I 936; MF 1102; PP 193-C, 580; WS 1835

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Pa. Geol. Survey (4th): A 48; C 26; G 3, 19, 40, 56A, 67; IC 16, 70, 72, 84; Map 24, 25, 32, 34; M 1, 2, 4, 5, 6, 10, 11, 17, 18(B), 19, 31, 39, 50, 51, 66, 68, 69, 74, 77; PG 7; PR 124, 126; W 1
U. S. Geol. Survey: B 1363; F 82, 94, 160; GP 445, 555; GQ 648, 743; HA 295; I 588, 743, 936; MF 529, 815; PP 580, 600-C, 650-C
U. S. Bur. Mines: R 4807, 4815, 7131, 7281, 8226r

FOREST

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FRANKLIN
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U. S. Geol. Survey: B 225[4], 285[3], 304, 318; F 82, 121, 146; GP 445, 555; GQ 826, 838, 1003; HA 295; I 588, 663, 699, 743, 936; MF 529, 815; PP 580, 600-C, 621; WS 110
U. S. Bur. Mines: I 8765; R 5143, 5434, 7131, 7281, 7827, 7910, 8118, 8217, 8231, 8286
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U. S. Bur. Mines: I 8765; R 4757, 4763, 5314, 7281, 8118
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Pa. Geol. Survey (4th): A 5, 27, 36, 37, 48, 54, 57, 64, 65, 74ab, 74cd, 75, 84cd, 85ab, 85cd, 95a, 124a, 133cd, 174c, 187ab; C 26, 30, 56A; ES 7; G 1, 56, 56A; IC 72; Map 2, 42, 45, 49; M 2, 4, 6, 8, 12, 42, 48, 55, 66, 68, 74, 75; PR 130, 159
U. S. Geol. Survey: B 256, 279, 285[1], [2], 286, 300, 318, 447, 454, 659, 829, 840, 873, 995-A, 1112-F, 1117-C, 1143-A, 1143-B, 1143-C, 1213, 1271-D; CI 3, 7, 10, 12, 13, 14, 19, 21, 25, 43, 46, 47, 48; F 82, 94, 102, 110, 115, 121, 123, 125, 133, 134, 144, 160, 174, 176, 177, 178, 180, 189, 224, 227; I 528, 529, 588, 663, 681, 689, 715, 734, 737, 743, 753, 809, 838; GQ 283, 296, 333, 334, 630, 648, 689, 690, 691, 692, 698, 699, 700, 701, 743, 781, 826, 838, 918, 919, 1003, 1028, 1029, 1054, 1067, 1132, 1133; PP 193-D, 450-C(72, 73, 74), 473-B, 580, 602, 621, 650, 978
U. S. Bur. Mines: B 491, 494, 513, 545; I 7213, 8274, 8379, 8409, 8453, 8738, 8765, 8785; R 4734, 4747, 4757, 4763, 4788, 4801, 4803, 4807, 4815, 4823, 4834, 4840, 4894, 4941, 4998, 5003, 5101, 5109, 5143, 5166, 5231, 5269, 5314, 5374, 5434, 5455, 5475, 5492, 5609, 5927, 6261, 6989, 7086, 7131, 7174, 7281, 7324, 7364, 7591, 7769, 7827, 7910, 8118, 8173, 8195, 8217, 8226r, 8230, 8231, 8247, 8286, 8354; TP 590, 645, 659
Misc.: Pa. Off. Environ. Protection: A

COBALT
Pa. Geol. Survey (4th): M 50(3), 56
Misc.: Min. Pa.: RS

COPPER
Pa. Geol. Survey (3rd): Biennial Report 1913-14
Pa. Geol. Survey (4th): A 127, 129a; C 1, 9, 48; G 33; M 50(3), 56
U. S. Geol. Survey: B 136, 430, 828, 891; F 162, 225
U. S. Bur. Mines: R 4666
Misc.: Min. Pa.: SG, RS

CRUSHED STONE, see **Stone**

DOLOMITE, see **Limestone**

FELDSPAR
Pa. Geol. Survey (4th): G 1; M 13
U. S. Geol. Survey: B 1082-K
Misc.: Min. Pa.: SG

FLAGSTONE, see **Stone**

FLUORITE
U. S. Geol. Survey: PP 580
Misc.: Min. Pa.: SG, RS

GANISTER, see **Stone**

GLASS SAND, see **Sand**

GOLD
Pa. Geol. Survey (4th): M 50(3), 56
Misc.: Min. Pa.: SG

GRANITE, see **Stone**

GRAPHITE
Pa. Geol. Survey (3rd): 6
Pa. Geol. Survey (4th): A 206; C 9, 39
U. S. Geol. Survey: B 891, 1082-E
U. S. Bur. Mines: R 4530
Misc.: Min. Pa.: SG

GROUNDWATER (Water Resources)
Pa. Geol. Survey (4th): A 5, 27, 36, 37, 48, 54, 55, 57, 65, 74ab, 74cd, 75, 84cd, 85ab, 85cd, 95a, 96, 109a, 119ab, 119cd, 129a, 136, 144ab, 146, 157d, 168, 177c, 177d, 178, 187ab, 194cd, 195ab, 195cd, 204ab, 204cd, 205a, 206, 214a, 223; C 1, 26, 30, 39, 48, 56A, 67; EG 4, 5, 6; ES 3; G 32, 56, 56a, 59, 71; IC 7, 56; Map 20; M 47; PR 146; W 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49
U. S. Geol. Survey: B 256, 300, 447, 828, 840, 855, 873, 891; Cir 174, 315; F 102, 121, 123, 133, 144, 146, 162, 167, 170, 172, 174, 177, 179, 180, 189, 223, 224, 225, 227; HA 295; MF 641-A, 641-B, 641-C; PP 204, 381, 417-A; WS 106, 108, 109, 110, 1539-H, 1879-H
Misc.: Pa. Off. Resources Mgt.: B 2, 3, 8; R; SWP 1, 5, 6, 9, 13, 14

IRON ORE
Pa. Geol. Survey (4th): A 36, 48, 54, 55, 57, 65, 95a, 96, 109a, 127, 129a, 133cd, 134ab, 136, 138ab, 157d, 167c, 168, 177d, 187ab, 206; C 1, 9, 26, 39, 48, 67; G 1; M 14, 18(B), 26, 49, 56
U. S. Geol. Survey: B 279, 359, 447, 799, 828, 840, 855, 873, 891, 920, 969-A, 995-D, 1082-K, 1173; F 82, 93, 115, 121, 125, 162, 170, 223, 224, 225, 227, 279; GQ 28; PP 204
U. S. Bur. Mines: R 4145, 4436

LEAD, see **Zinc**

LIMESTONE (Dolomite, Marble)
Pa. Geol. Survey (4th): A 5, 27, 36, 37, 48, 54, 55, 57, 64, 65, 74cd, 75, 84cd, 85ab, 85cd, 95a, 96, 109a, 119ab, 119cd, 124a, 126, 127, 129a, 134ab, 136, 137ab, 137cd, 138ab, 144ab, 146, 148ab, 157d, 167c, 167d, 168, 177c, 177d, 178, 187ab, 206; C 1, 9, 26, 30, 39, 48, 56A, 67; EG 1, 6; G 1, 22, 26, 31, 37, 38, 44, 45, 47, 49, 52, 53, 56, 56A, 58; IC 60, 76; Map 15; M 7, 15, 20, 50(1, 4), 67; PR 136, 140, 170, 171, 179, 180; W 1, 2, 5, 6, 7, 11, 15, 16, 18, 25, 26, 27, 29, 31, 32
U. S. Geol. Survey: B 256, 279, 286, 300, 447, 799, 828, 840, 855, 873, 920, 1194-L; F 82, 92, 93, 94, 102, 111, 115, 125, 133, 134, 144, 146, 170, 174, 177, 178, 180, 189, 224, 225, 227; PP 204, 580, 700-B

MAGNESITE
U. S. Geol. Survey: B 1082-K
Misc.: Min. Pa.: SG

MANGANESE
Pa. Geol. Survey (4th): A 138ab; C 1, 39, 48; G 33; M 26, 27; PR 128
U. S. Geol. Survey: F 170, 225; GQ 28
U. S. Bur. Mines: R 4312, 4326, 4436
Misc.: Min. Pa.: SG

MARBLE, see **Limestone**

MICA
Pa. Geol. Survey (4th): A 177c, 206; G 1
Misc.: Min. Pa.: SG

MINERAL PIGMENTS (Mineral Paint)
Pa. Geol. Survey (3rd): 4
Pa. Geol. Survey (4th): A 206; C 9, 39, 48

MOLYBDENUM
Pa. Geol. Survey (3rd): 5, 9
Pa. Geol. Survey (4th): G 33; M 50(3)
Misc.: Min. Pa.: SG, AM, RS

NATURAL GAS, see **Oil and Gas**

NICKEL
Pa. Geol. Survey (3rd): 8, 9
Pa. Geol. Survey (4th): G 33; M 5, 50(3), 56
U. S. Geol. Survey: B 799
Misc.: Min. Pa.: SG, RS

OIL AND GAS (Natural Gas, Petroleum)
Pa. Geol. Survey (4th): A 27, 36, 37, 48, 54, 55, 57, 64, 65, 74ab, 74cd, 75, 84cd, 85ab, 95a, 124a, 133cd, 134ab, 136, 144ab, 223; C 26, 30, 56A; ES 8; G 21, 22, 60; IC 3, 16, 80; Map 3, 4, 5, 6, 9, 10, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 40, 44, 46, 47, 50, 51, 52, 53, 55; M 1, 19, 21, 22, 24, 25, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 45, 46, 52, 53, 54, 57, 59, 60, 62, 65, 70, 73; PR 106, 107, 109, 110, 111, 114, 117, 118, 122, 123, 124, 125, 127, 129, 131, 133, 135, 138, 139, 142, 143, 144, 147, 148, 150, 151, 154, 155, 157, 158, 160, 165, 166, 168, 172, 173, 175, 177, 178, 181, 183, 186, 187, 188, 189, 190, 191, 192; SB 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11; WSR 56
U. S. Geol. Survey: B 225[3], [4], 256, 279, 285[3], 286, 300, 304, 318, 454, 456, 531, 829, 873, 1173, 1213, 1409; F 82, 92, 94, 102, 110, 115, 121, 123, 125, 134, 144, 146, 172, 177, 178, 180, 189; I 917-A, 917-B, 917-C, 917-D, 917-E, 936; OC 64, 82, 86
U. S. Bur. Mines: I 8473, 8765; R 3385, 4842, 5438, 6471, 6917, 6942, 6943, 8173
Misc.: Pa. Off. Environ. Protection: A

PEAT
Pa. Geol. Survey (4th): A 194cd, 204ab, 204cd, 206, 214a, 214c, 223; C 48; G 57, 71; IC 65
U. S. Geol. Survey: B 1317-A; PP 580, 700-D

PHOSPHATE
Pa. Geol. Survey (4th): G 33; IC 64
Misc.: Min. Pa.: SG

PYRITE
Pa. Geol. Survey (3rd): 9, 11
Pa. Geol. Survey (4th): A 206; C 39; G 1, 33; M 50(3), 56
Misc.: Min. Pa.: SG

PYROPHYLLITE
U. S. Geol. Survey: PP 700-C

QUARTZ (Sand and Vein), see **Sand**

ROOFING GRANULES
Pa. Geol. Survey (4th): C 1, 67
U. S. Geol. Survey: PP 580

RUTILE
U. S. Geol. Survey: B 624, 1082-K
Misc.: Min. Pa.: SG

SALT (Brine)
Pa. Geol. Survey (4th): G 1; M 18, 47, 58; PR 145
U. S. Geol. Survey: F 110; PP 580

SAND (Sand and Gravel, Molding Sand, Glass Sand, Quartz)
Pa. Geol. Survey (3rd): 12
Pa. Geol. Survey (4th): A 5, 27, 36, 54, 55, 64, 74cd, 84cd, 85ab, 85cd, 95a, 96, 109a, 119ab, 119cd, 129a, 134ab, 136, 137ab, 137cd, 138ab, 144ab, 148ab, 168, 174c, 177c, 177d, 178, 187ab, 194cd, 195ab, 195cd, 204ab, 204cd, 206, 214a, 214c, 223; C 1, 9, 26, 30, 39, 48; EG 6; G 1, 7, 10, 23, 32, 54, 57, 60, 64, 71; IC 86; M 3, 11, 64, 67
U. S. Geol. Survey: B 279, 286, 447, 799, 828, 840, 855, 873, 891, 1121-B; F 82, 94, 115, 162, 167, 172, 177; PP 204, 288, 379, 580

SANDSTONE
Pa. Geol. Survey (4th): A 5, 27, 36, 48, 54, 55, 57, 64, 65, 74ab, 74cd, 75, 84cd, 85ab, 85cd, 95a, 96, 109a, 119cd, 127, 136, 137ab, 137cd, 146, 177c, 194cd, 195ab, 195cd, 204ab, 206, 223; C 1, 9, 26, 30, 39, 48, 56A; G 1, 54, 63; M 3, 15, 67
U. S. Geol. Survey: B 256, 279, 286, 300, 447, 828, 855, 873, 891; F 82, 102, 125, 134, 144, 146, 177, 178, 180; PP 580

SCHEELITE (Tungsten)
Pa. Geol. Survey (3rd): 9

SERPENTINE
Pa. Geol. Survey (3rd): 5
Pa. Geol. Survey (4th): C 48; G 46; IC 13, 14; M 15; PR 153; W 2, 25
U. S. Geol. Survey: B 725-B, 920, 1082-K; I 476
Misc.: Min. Pa.: SG

SHALE, see **Clay**

SILVER
Pa. Geol. Survey (3rd): 9
Pa. Geol. Survey (4th): G 33; M 5, 50(3), 56, 72
U. S. Geol. Survey: B 799, 855, 1314-C

SLATE
Pa. Geol. Survey (4th): A 195cd, 206; C 1, 39, 48; G 1; IC 2; M 9, 16, 51, 63
U. S. Geol. Survey: B 920, 1082-K; MF 578-A; PP 580

STONE (Building Stone, Crushed Stone, Ganister, Granite), see also specific type of stone
Pa. Geol. Survey (4th): A 5, 27, 36, 37, 48, 54, 55, 57, 64, 65, 74cd, 75, 84cd, 85ab, 85cd, 95a, 96, 109a, 119ab, 119cd, 124a, 127, 129a, 133cd, 134ab, 136, 137ab, 137cd, 138ab, 144ab, 148ab, 157d, 167d, 168, 174c, 177c, 177d, 178, 187ab, 194cd, 195ab, 204ab, 204cd, 206, 214a, 214c, 223; C 1, 9, 26, 30, 39, 48, 56A, 67; EG 5; G 44, 54; IC 66; M 15, 67; PR 174
U. S. Geol. Survey: B 279, 380, 447, 828, 840, 855, 891; F 82, 92, 94, 110, 115, 121, 133, 162, 167, 170, 172, 174, 211, 223, 227, 279; PP 204, 580

TALC
Pa. Geol. Survey (3rd): 5
U. S. Geol. Survey: B 920, 1082-K
Misc.: Min. Pa.: SG

THORIUM
Pa. Geol. Survey (4th): G 33
Misc.: Min. Pa.: AM

TITANIUM, see **Rutile**

TUNGSTEN, see **Scheelite**

URANIUM
Pa. Geol. Survey (3rd): 9
Pa. Geol. Survey (4th): A 174c, 195ab, 195cd; G 33; IC 5; M 43; PR 152
U. S. Geol. Survey: B 1107-D, 1138; Cir 350; PP 400-B, 580
Misc.: Min. Pa.: AM, RS

VANADIUM
Pa. Geol. Survey (3rd): 9
Pa. Geol. Survey (4th): M 43
U. S. Geol. Survey: B 1107-D, 1138
Misc.: Min. Pa.: SG

VERMICULITE
Pa. Geol. Survey (4th): M 18
Misc.: Min. Pa.: SG

WATER RESOURCES, see **Groundwater**

ZINC
Pa. Geol. Survey (3rd): Biennial Report 1910-1912
Pa. Geol. Survey (4th): A 96, 144ab, 168, 187ab, 206; C 9, 26, 39; G 33; M 5, 50(3), 72
U. S. Geol. Survey: B 855, 891, 920, 1314-C
U. S. Bur. Mines: R 4180, 4247, 4422, 4451, 4703, 4743
Misc.: Min. Pa.: SG, RS

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